



wwPDB EM Validation Summary Report ⓘ

Jul 16, 2025 – 02:42 AM JST

PDB ID : 9J52 / pdb_00009j52
EMDB ID : EMD-61140
Title : CryoEM structure of human XPR1 in complex with phosphate in state B
Authors : Zhang, W.H.; Chen, Y.K.; Guan, Z.Y.; Liu, Z.
Deposited on : 2024-08-11
Resolution : 3.10 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

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with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

EMDB validation analysis : **FAILED**
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

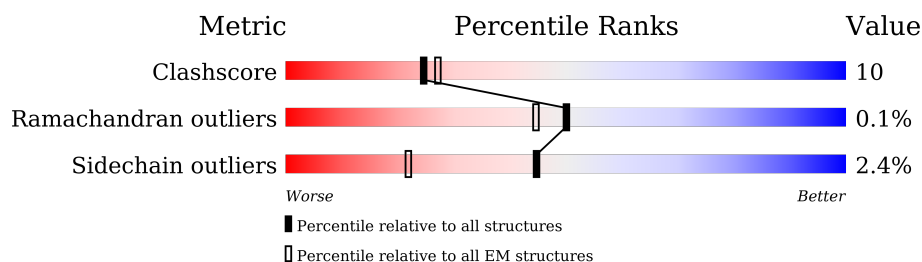
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$.

Mol	Chain	Length	Quality of chain
1	A	720	
1	B	720	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
3	PO4	A	803	-	-	X	-

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 6593 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Solute carrier family 53 member 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	382	Total	C	N	O	S	0	0
			3186	2143	510	518	15		
1	B	382	Total	C	N	O	S	0	0
			3186	2143	510	518	15		

There are 48 discrepancies between the modelled and reference sequences:

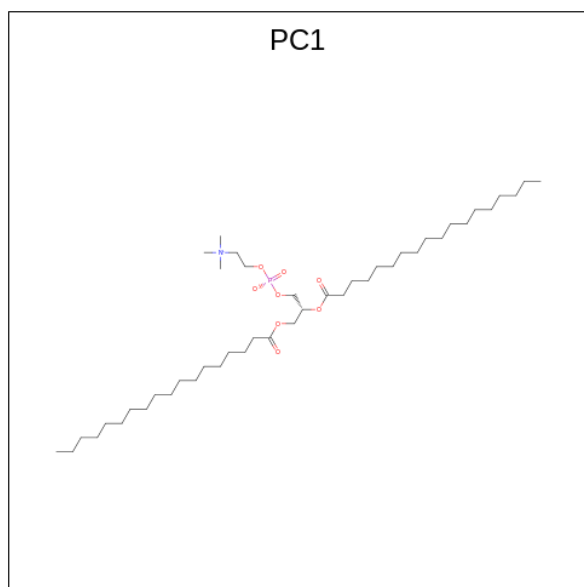
Chain	Residue	Modelled	Actual	Comment	Reference
A	697	LEU	-	expression tag	UNP Q9UBH6
A	698	GLU	-	expression tag	UNP Q9UBH6
A	699	ASP	-	expression tag	UNP Q9UBH6
A	700	TYR	-	expression tag	UNP Q9UBH6
A	701	LYS	-	expression tag	UNP Q9UBH6
A	702	ASP	-	expression tag	UNP Q9UBH6
A	703	HIS	-	expression tag	UNP Q9UBH6
A	704	ASP	-	expression tag	UNP Q9UBH6
A	705	GLY	-	expression tag	UNP Q9UBH6
A	706	ASP	-	expression tag	UNP Q9UBH6
A	707	TYR	-	expression tag	UNP Q9UBH6
A	708	LYS	-	expression tag	UNP Q9UBH6
A	709	ASP	-	expression tag	UNP Q9UBH6
A	710	HIS	-	expression tag	UNP Q9UBH6
A	711	ASP	-	expression tag	UNP Q9UBH6
A	712	ILE	-	expression tag	UNP Q9UBH6
A	713	ASP	-	expression tag	UNP Q9UBH6
A	714	TYR	-	expression tag	UNP Q9UBH6
A	715	LYS	-	expression tag	UNP Q9UBH6
A	716	ASP	-	expression tag	UNP Q9UBH6
A	717	ASP	-	expression tag	UNP Q9UBH6
A	718	ASP	-	expression tag	UNP Q9UBH6
A	719	ASP	-	expression tag	UNP Q9UBH6
A	720	LYS	-	expression tag	UNP Q9UBH6
B	697	LEU	-	expression tag	UNP Q9UBH6
B	698	GLU	-	expression tag	UNP Q9UBH6

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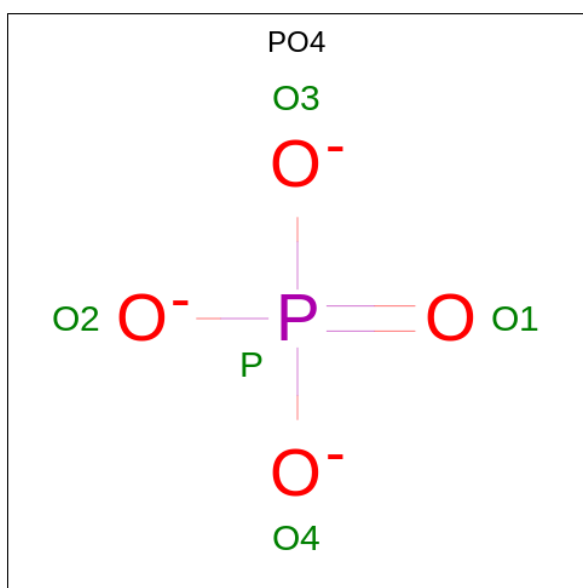
Chain	Residue	Modelled	Actual	Comment	Reference
B	699	ASP	-	expression tag	UNP Q9UBH6
B	700	TYR	-	expression tag	UNP Q9UBH6
B	701	LYS	-	expression tag	UNP Q9UBH6
B	702	ASP	-	expression tag	UNP Q9UBH6
B	703	HIS	-	expression tag	UNP Q9UBH6
B	704	ASP	-	expression tag	UNP Q9UBH6
B	705	GLY	-	expression tag	UNP Q9UBH6
B	706	ASP	-	expression tag	UNP Q9UBH6
B	707	TYR	-	expression tag	UNP Q9UBH6
B	708	LYS	-	expression tag	UNP Q9UBH6
B	709	ASP	-	expression tag	UNP Q9UBH6
B	710	HIS	-	expression tag	UNP Q9UBH6
B	711	ASP	-	expression tag	UNP Q9UBH6
B	712	ILE	-	expression tag	UNP Q9UBH6
B	713	ASP	-	expression tag	UNP Q9UBH6
B	714	TYR	-	expression tag	UNP Q9UBH6
B	715	LYS	-	expression tag	UNP Q9UBH6
B	716	ASP	-	expression tag	UNP Q9UBH6
B	717	ASP	-	expression tag	UNP Q9UBH6
B	718	ASP	-	expression tag	UNP Q9UBH6
B	719	ASP	-	expression tag	UNP Q9UBH6
B	720	LYS	-	expression tag	UNP Q9UBH6

- Molecule 2 is 1,2-DIACYL-SN-GLYCERO-3-PHOSPHOCHOLINE (CCD ID: PC1) (formula: $C_{44}H_{88}NO_8P$).



Mol	Chain	Residues	Atoms					AltConf
2	A	1	Total	C	N	O	P	0
			54	44	1	8	1	
2	A	1	Total	C	N	O	P	0
			54	44	1	8	1	
2	B	1	Total	C	N	O	P	0
			54	44	1	8	1	
2	B	1	Total	C	N	O	P	0
			54	44	1	8	1	

- Molecule 3 is PHOSPHATE ION (CCD ID: PO4) (formula: O₄P).

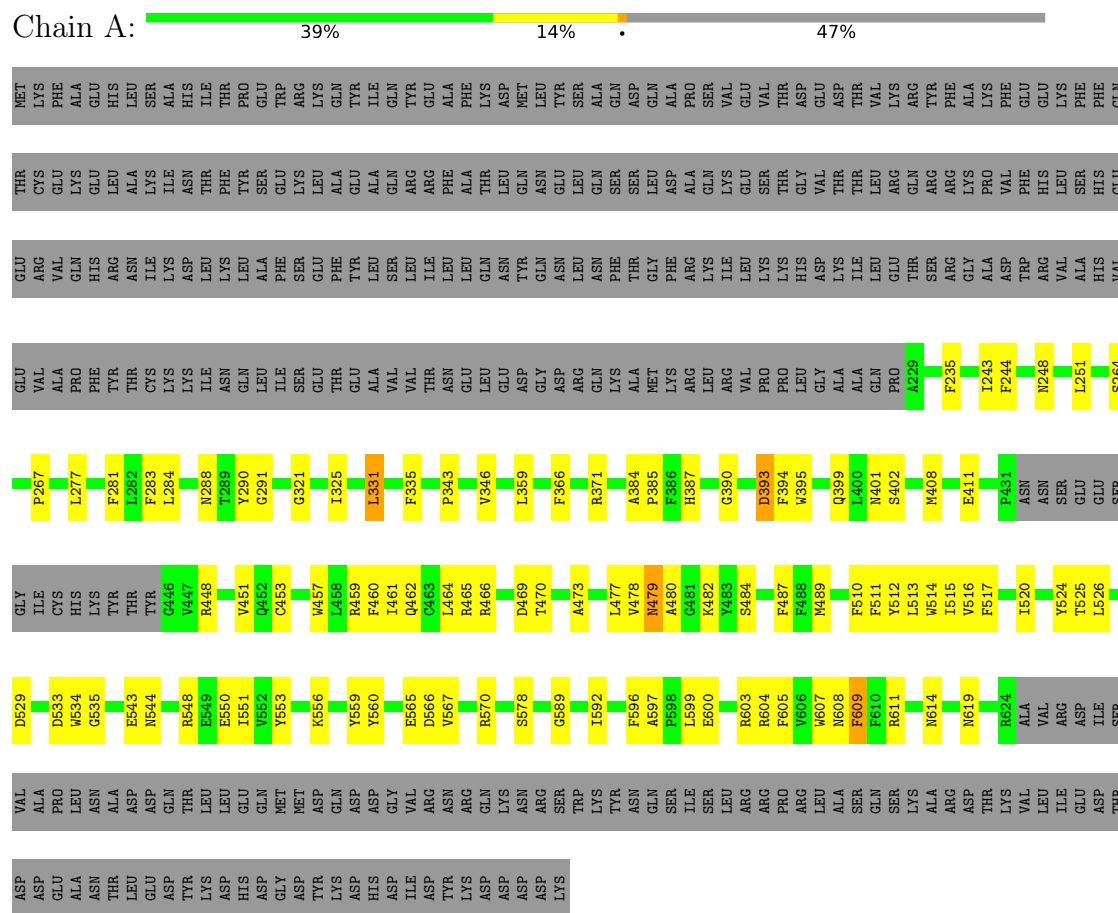


Mol	Chain	Residues	Atoms			AltConf
3	A	1	Total	O	P	0
			5	4	1	

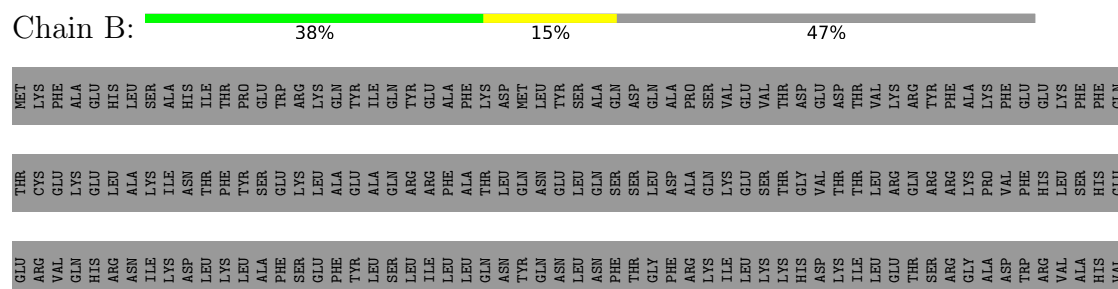
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Solute carrier family 53 member 1



• Molecule 1: Solute carrier family 53 member 1



THR	LVS	VAL	VAL	ARG	ASP	THR	ASP	GLU	ASP	THR	GLN	ASP	THR	LVS	ILE	ASN	GLN	LEU	THR	SER	GLU	THR	GLU	ALA	VAL	VAL	THR	ASN	GLU	LEU	GLU	ASP	GLY	ASP	ASP	ASP	ASP	ASP	ASP	LVS	ARG	LEU	VAL	PRO	PRO	GLY	ALA	ALA	GLN	PRO	A229	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359	I360	T365	T366	Y367	R371	L377	T383	K258	L259	E260	P267	W395	K471	R472	P475	H476	K482	Y483	S484	T485	T486	F487	Y496	M508	F511	D529	D533	W534	R548	D566	R570	F571	A572	W573	T574	L575	Q576	L585	S588	G589	D590	V595	F596	A597	P598	L599	E600	R604	W607	N608	L612	N618	C621	R270	R271	Y272	R273	L277	L278	L279	E280	Y290	G291	W292	N306	H313	Q314	H315	I319	G324	W327	S330	L331	L332	A333	G334	F335	F336	A337	P338	L351	Y352	G353	F354	F357	F358	L359
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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	141213	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PO4, PC1

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.17	0/3292	0.31	0/4479
1	B	0.18	0/3292	0.34	0/4479
All	All	0.17	0/6584	0.33	0/8958

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3186	0	3186	67	0
1	B	3186	0	3186	69	0
2	A	108	0	176	5	0
2	B	108	0	176	10	0
3	A	5	0	0	3	0
All	All	6593	0	6724	139	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 10.

The worst 5 of 139 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:479:ASN:OD1	1:A:479:ASN:N	2.18	0.75
1:A:570:ARG:NH1	3:A:803:PO4:O2	2.20	0.74
1:B:576:GLN:HE22	1:B:597:ALA:HB2	1.51	0.74
1:A:529:ASP:OD2	1:A:570:ARG:NH2	2.22	0.73
1:A:604:ARG:O	1:A:608:ASN:ND2	2.23	0.71

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	378/720 (52%)	359 (95%)	19 (5%)	0	100	100
1	B	378/720 (52%)	347 (92%)	30 (8%)	1 (0%)	37	68
All	All	756/1440 (52%)	706 (93%)	49 (6%)	1 (0%)	50	79

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	447	VAL

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	339/644 (53%)	329 (97%)	10 (3%)	37	65

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	B	339/644 (53%)	333 (98%)	6 (2%)	54 76
All	All	678/1288 (53%)	662 (98%)	16 (2%)	45 70

5 of 16 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	585	LEU
1	B	393	ASP
1	A	565	GLU
1	B	377	LEU
1	A	479	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 14 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	616	HIS
1	B	315	HIS
1	B	576	GLN
1	B	401	ASN
1	B	462	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

5 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and

the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	PC1	B	801	-	53,53,53	0.50	0	59,61,61	0.47	1 (1%)
2	PC1	A	801	-	53,53,53	0.48	0	59,61,61	0.51	1 (1%)
3	PO4	A	803	-	4,4,4	1.44	1 (25%)	6,6,6	0.43	0
2	PC1	A	802	-	53,53,53	0.51	0	59,61,61	0.50	1 (1%)
2	PC1	B	802	-	53,53,53	0.50	0	59,61,61	0.47	1 (1%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	PC1	A	802	-	-	23/57/57/57	-
2	PC1	B	801	-	-	22/57/57/57	-
2	PC1	A	801	-	-	16/57/57/57	-
2	PC1	B	802	-	-	28/57/57/57	-

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	803	PO4	P-O1	2.49	1.56	1.50

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	801	PC1	O12-P-O14	2.34	123.83	112.24
2	B	802	PC1	O12-P-O14	2.28	123.51	112.24
2	A	802	PC1	O12-P-O14	2.20	123.12	112.24
2	B	801	PC1	O12-P-O14	2.20	123.09	112.24

There are no chirality outliers.

5 of 89 torsion outliers are listed below:

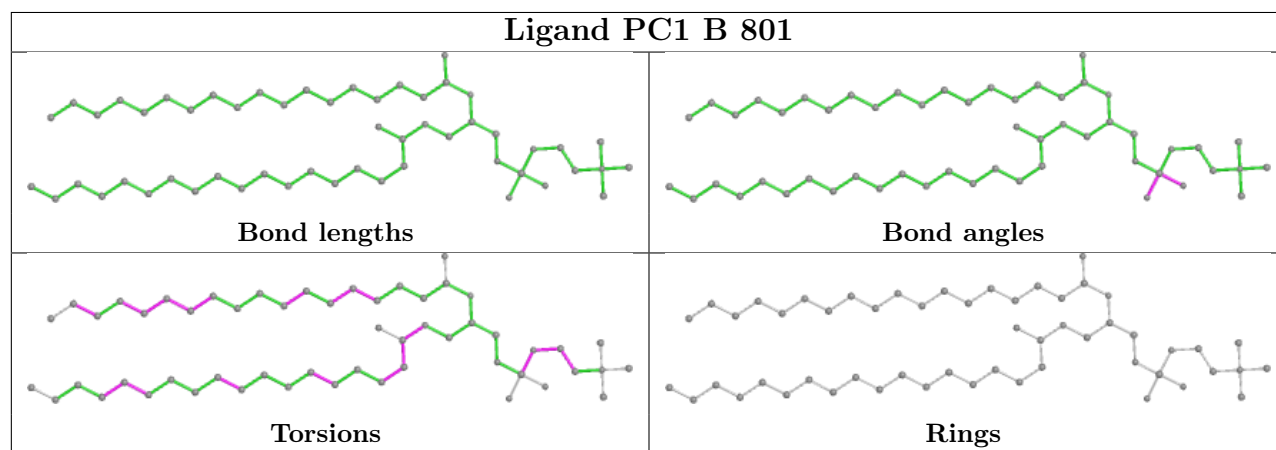
Mol	Chain	Res	Type	Atoms
2	A	801	PC1	C11-O13-P-O12
2	A	801	PC1	O13-C11-C12-N
2	B	801	PC1	C11-O13-P-O12
2	B	801	PC1	O13-C11-C12-N
2	B	802	PC1	C11-O13-P-O14

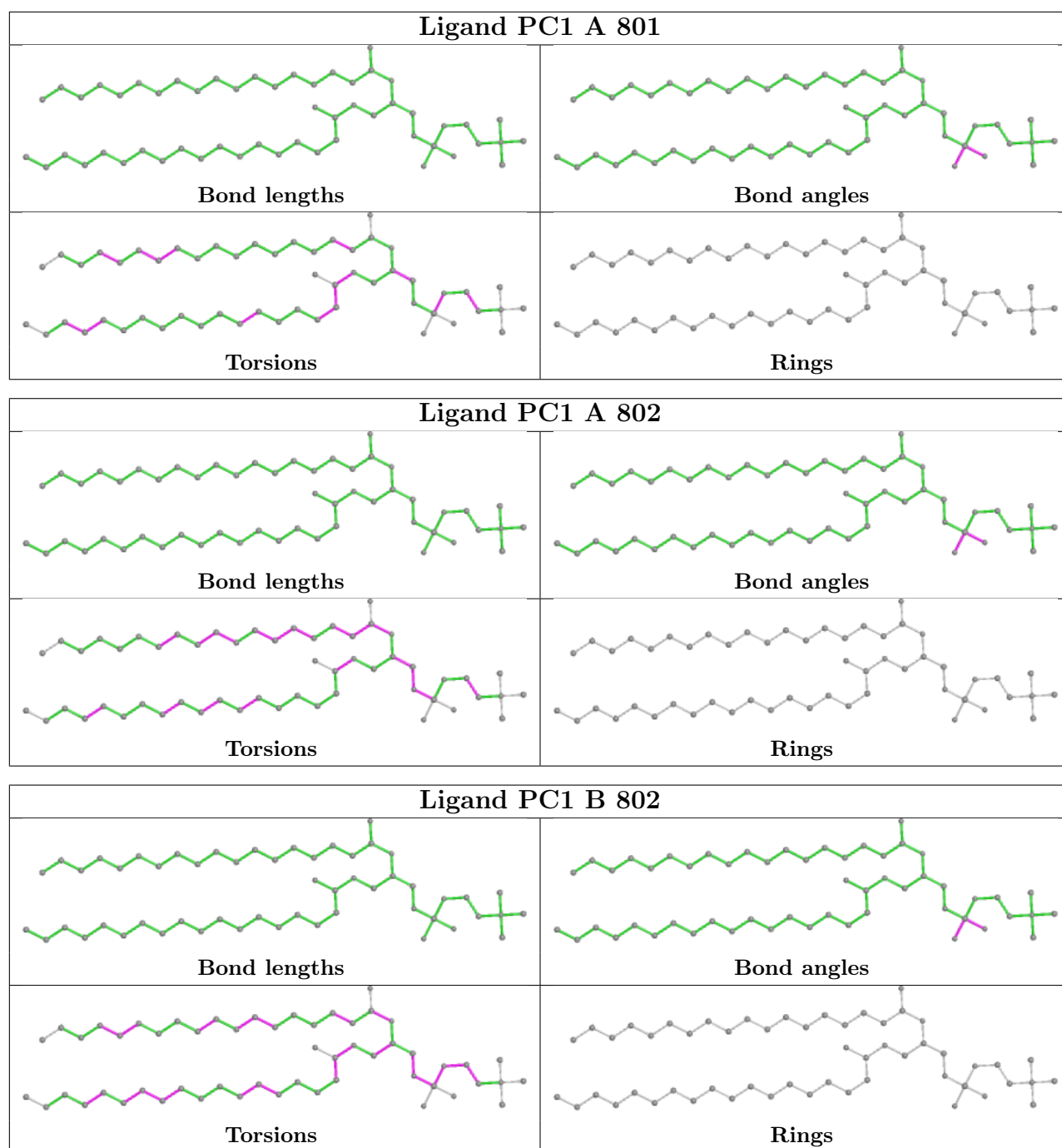
There are no ring outliers.

5 monomers are involved in 18 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	801	PC1	3	0
2	A	801	PC1	2	0
3	A	803	PO4	3	0
2	A	802	PC1	3	0
2	B	802	PC1	7	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.